

WHAT IS CLAIMED IS:

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- 10 1. A method for fulfilling a data service request, the method comprising:
- 15 providing an ontology description of a data service;
providing a first logical search object operably coupled via a first communications link to a data provider;
transmitting by the first logical search object to the data provider via the communications link a search request, the search request generated by the first logical search object from the data service request;
receiving by the first logical search object from the data provider via the communications link a data set in response to the search request; and
generating by the first logical search object a knowledge instance from the data set using the ontology description.
- 20 2. The method of claim 1 wherein the first communications link is adapted for communications with a database server.
3. The method of claim 1 wherein the first communications link is adapted for communications with a FTP server.
- 25 4. The method of claim 1 wherein the first communications link is adapted for communications with a Web server.
- 30 5. The method of claim 1 wherein the first communications link is adapted for communications with a file system.
- 35 6. The method of claim 1 wherein the first communications link is adapted for communication with a human data provider.

7. The method of claim 1 wherein the first communications link
is adapted for communication with a communications protocol
proprietary to the data provider.

8. The method of claim 1 wherein the data service request is
included in a XML document.

9. The method of claim 1, further comprising:
providing a first workflow operably coupled to the
logical search object; and
transmitting by the first logical search object to the
first workflow the knowledge instance.

10. The method of claim 9 further comprising providing a second
logical search object operably coupled to the first
workflow, the first workflow encapsulating the ontological
relationship between the first and second logical search
objects.

11. The method of claim 9, further comprising:
providing an application server operably coupling a
data client to the first workflow via a second
communications link, and
receiving by the application server from the data
client via the second communications link a data service
request message, the data service request message including
the data service request;
transmitting by the application server to the first
workflow the data service request message; and
transmitting by the first workflow to the logical
search object the data service request message.

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12. The method of claim 10, wherein the second communications link is adapted for communications using SMTP.

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13. The method of claim 10, wherein the second communications link is adapted for communications using JMS.

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14. The method of claim 10, wherein the second communications link is adapted for communications using HTTP.

15. The method of claim 10, wherein the second communications link is adapted for communications using RMI.

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16. The method of claim 9, wherein the logical search object is specified by the first workflow.

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17. The method of claim 11, wherein the first workflow is specified by the application server using the service request message.

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18. The method of claim 10 further comprising:
providing a formatter; and
formatting by the formatter the data set encapsulated in the knowledge instance into a format requested by the data client.

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19. The method of claim 9 further comprising providing a second workflow operably coupled to the first workflow.

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20. A method for accessing by a software object a data provider via a communications link, comprising:
receiving by the software object from a second software object a search request message document;

generating by the software object a data request for
the data provider from the search request message document;
5 transmitting by the software object to the data
provider the data request via the communications link;
receiving by the software object from the data
provider a data set via the communications link; and
10 generating by the software object a semantic object
from the data set.

21. The method of claim 20 wherein generating by the software
object a semantic object from the data set further
includes:

15 providing a parser adaptor operably coupled to the
software object;

providing a parser semantic description of the data
set for use by the parser adaptor;

providing a semantic object semantic description;

20 generating by the parser adaptor extracted data from
the data set using the parser semantic description; and

generating by the parser adaptor the semantic object
using the extracted data according to the semantic object
semantic description.

25 22. The method of claim 20 wherein generating by the software
object a data request for the data provider from the search
request further includes:

30 providing a request builder operably coupled to the
software object;

providing a native object operably coupled to the
request builder, the native object encapsulating
implementation details of a data request for the data
provider;

providing a native semantic description including
ontology information describing a data structure used by
the request builder to build the data request for the data
provider;

transmitting by the request builder to the native
object the search request; and

generating by the native object the data request from
the search request using the native semantic description.

23. A data processing system adapted to fulfill a data service
request, comprising:

a processor; and

a memory operably coupled to the processor and having
program instructions stored therein, the processor being
operable to execute the program instructions, the program
instructions including:

providing an ontology description of a data
service;

providing a first logical search object operably
coupled via a first communications link to a data
provider;

transmitting by the first logical search object
to the data provider via the communications link a
search request, the search request generated by the
first logical search object from the data service
request;

receiving by the first logical search object from
the data provider via the communications link a data
set in response to the search request; and

generating by the first logical search object a
knowledge instance from the data set using the
ontology description.

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24. The data processing system of claim 23 wherein the first
communications link is adapted for communications with a
5 database server.

25. The data processing system of claim 23 wherein the first
communications link is adapted for communications with a
FTP server.

10 26. The data processing system of claim 23 wherein the first
communications link is adapted for communications with a
Web server.

15 27. The data processing system of claim 23 wherein the first
communications link is adapted for communications with a
file system.

20 28. The data processing system of claim 23 wherein the first
communications link is adapted for communication with a
human data provider.

25 29. The data processing system of claim 23 wherein the first
communications link is adapted for communication with a
communications protocol proprietary to the data provider.

30. The data processing system of claim 23 wherein the data
service request is included in a XML document.

30 31. The data processing system of claim 23, the program
instructions further including:

providing a first workflow operably coupled to the
logical search object; and

transmitting by the first logical search object to the
35 first workflow the knowledge instance.

32. The data processing system of claim 31, the program instructions further including providing a second logical search object operably coupled to the first workflow, the first workflow encapsulating the ontological relationship between the first and second logical search objects.

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10 33. The data processing system of claim 31, the program instructions further including:

providing an application server operably coupling a data client to the first workflow via a second communications link, and

receiving by the application server from the data client via the second communications link a data service request message, the data service request message including the data service request;

transmitting by the application server to the first workflow the data service request message; and

transmitting by the first workflow to the logical search object the data service request message.

34. The data processing system of claim 32, wherein the second communications link is adapted for communications using SMTP.

35. The data processing system of claim 32, wherein the second communications link is adapted for communications using JMS.

36. The data processing system of claim 32, wherein the second communications link is adapted for communications using HTTP.

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5 37. The data processing system of claim 32, wherein the second communications link is adapted for communications using RMI.

38. The data processing system of claim 32, wherein the logical search object is specified by the first workflow.

10 39. The data processing system of claim 33, wherein the first workflow is specified by the application server using the service request message.

15 40. The data processing system of claim 32, the program instructions further including:
providing a formatter; and
formatting by the formatter the data set encapsulated in the knowledge instance into a format requested by the data client.

20 41. The data processing system of claim 31, the program instructions further including providing a second workflow operably coupled to the first workflow.

25 42. A data processing system adapted to access a data provider via a communications link, comprising:

30 a processor; and
a memory operably coupled to the processor and having program instructions stored therein, the processor being operable to execute the program instructions, the program instructions including:

receiving by a software object a search request message document;

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generating by the software object a data request
for the data provider from the search request message
document;

transmitting by the software object to the data
provider the data request via the communications link;

receiving by the software object from the data
provider a data set via the communications link; and

generating by the software object a semantic
object from the data set.

43. The data processing system of claim 42 wherein the program
instructions for generating by the software object a
semantic object from the data set further include:

providing a parser adaptor operably coupled to the
software object;

providing a parser semantic description of the data
set for use by the parser adaptor;

providing a semantic object semantic description;

generating by the parser adaptor extracted data from
the data set using the parser semantic description; and

generating by the parser adaptor the semantic object
using the extracted data according to the semantic object
semantic description.

44. The data processing system of claim 42 wherein the program
instructions for generating by the software object a data
request for the data provider from the search request
further include:

providing a request builder operably coupled to the
software object;

providing a native object operably coupled to the
request builder, the native object encapsulating

implementation details of a data request for the data provider;

5 providing a native semantic description including ontology information describing a data structure used by the request builder to build the data request for the data provider;

10 transmitting by the request builder to the native object the search request; and

generating by the native object the data request from the search request using the native semantic description.

45. A computer readable media embodying program instructions for execution by a computer, the computer program instructions adapting a computer to fulfill a data service request, the program instructions comprising:

15 providing an ontology description of a data service;
 providing a first logical search object operably coupled via a first communications link to a data provider;
 20 transmitting by the first logical search object to the data provider via the communications link a search request, the search request generated by the first logical search object from the data service request;

25 receiving by the first logical search object from the data provider via the communications link a data set in response to the search request; and

30 generating by the first logical search object a knowledge instance from the data set using the ontology description.

46. The computer readable media of claim 45 wherein the first communications link is adapted for communications with a database server.

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5 47. The computer readable media of claim 45 wherein the first communications link is adapted for communications with a FTP server.

10 48. The computer readable media of claim 45 wherein the first communications link is adapted for communications with a Web server.

15 49. The computer readable media of claim 45 wherein the first communications link is adapted for communications with a file system.

20 50. The computer readable media of claim 45 wherein the first communications link is adapted for communication with a human data provider.

25 51. The computer readable media of claim 45 wherein the first communications link is adapted for communication with a communications protocol proprietary to the data provider.

30 52. The computer readable media of claim 45 wherein the data service request is included in a XML document.

35 53. The computer readable media of claim 45, the program instructions further comprising:

providing a first workflow operably coupled to the logical search object; and

transmitting by the first logical search object to the first workflow the knowledge instance.

54. The computer readable media of claim 53, the program instructions further comprising providing a second logical search object operably coupled to the first workflow, the

first workflow encapsulating the ontological relationship between the first and second logical search objects.

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55. The computer readable media of claim 53, the program instructions further comprising:

providing an application server operably coupling a data client to the first workflow via a second communications link, and

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receiving by the application server from the data client via the second communications link a data service request message, the data service request message including the data service request;

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transmitting by the application server to the first workflow the data service request message; and

transmitting by the first workflow to the logical search object the data service request message.

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56. The computer readable media of claim 54, wherein the second communications link is adapted for communications using SMTP.

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57. The computer readable media of claim 54, wherein the second communications link is adapted for communications using JMS.

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58. The computer readable media of claim 54, wherein the second communications link is adapted for communications using HTTP.

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59. The computer readable media of claim 54, wherein the second communications link is adapted for communications using RMI.

60. The computer readable media of claim 54, wherein the logical search object is specified by the first workflow.

61. The computer readable media of claim 54, wherein the first workflow is specified by the application server using the service request message.

62. The computer readable media of claim 54, the program instructions further comprising:

providing a formatter; and

formatting by the formatter the data set encapsulated in the knowledge instance into a format requested by the data client.

63. The computer readable media of claim 53, the program instructions further comprising providing a second workflow operably coupled to the first workflow.

64. A computer readable media embodying program instructions for execution by a computer, the computer program instructions adapting a computer to access a data provider via a communications link, the program instructions comprising:

receiving by a software object a search request message document;

generating by the software object a data request for the data provider from the search request message document;

transmitting by the software object to the data provider the data request via the communications link;

receiving by the software object from the data provider a data set via the communications link; and

generating by the software object a semantic object from the data set.

65. The data processing system of claim 64 wherein the program instructions for generating by the software object a semantic object from the data set further comprise:

providing a parser adaptor operably coupled to the software object;

providing a parser semantic description of the data set for use by the parser adaptor;

providing a semantic object semantic description;

generating by the parser adaptor extracted data from the data set using the parser semantic description; and

generating by the parser adaptor the semantic object using the extracted data according to the semantic object semantic description.

66. The data processing system of claim 64 wherein the program instructions for generating by the software object a data request for the data provider from the search request further comprise:

providing a request builder operably coupled to the software object;

providing a native object operably coupled to the request builder, the native object encapsulating implementation details of a data request for the data provider;

providing a native semantic description including ontology information describing a data structure used by the request builder to build the data request for the data provider;

transmitting by the request builder to the native object the search request; and

generating by the native object the data request from the search request using the native semantic description.